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THE GENUS LASIA (DIPTERA, CYRTIDÆ) IN NORTH AMERICA, WITH DESCRIPTIONS OF TWO NEW SPECIES

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The discovery in Yucatan of an apparently undescribed species of Lasia has led me to collect a few notes on this genus, which is represented by very few specimens in most collections. I have been able to examine the types of all the species known from north of Panama. The holotype of L. klettii was studied at the Museum of Comparative Zoölogy, Cambridge, Mass.; one of the two cotypes of L. scribæ was very obligingly sent to me by Dr. Walther Horn; while the holotypes of L. colei and L. rostrata were seen at the U. S. National Museum.

LASIA Wiedemann

Lasia Wiedemann, 1824, 'Analecta Entomologica,' p. 11 (monotypic for Lasia splendens Wiedemann, 1824); 1828, 'Aussereurop, Zweifl. Ins.,' I, p. 329. Cole, 1919, Trans. Amer. Ent. Soc., XLV, p. 27.

Panops Wiedemann, 1830, 'Aussereurop. Zweifl. Ins.,' II, p. 18 (in part). Bigot, 1889, Ann. Soc. Ent. France, (6) IX, pp. 314 and 316. Kertész, 1909, 'Cat. Dipt.,' IV, p. 8 (in part). Not of Lamarck.

Vertexistemma Bigot, 1856, Ann. Soc. Ent. France, (3) IV, pp. 65, 87 (monotypic for Panops ocelliger Wiedemann, 1830).

Verticistemma Bigor, 1859, Ann. Soc. Ent. France, (3) VII, p. 210 (emendation of Vertexistemma).

Lasia was rather poorly defined by Wiedemann, the original diagnosis containing, for instance, the erroneous statement: "ocelli nulli." The drawing which he first gave of the wing of Lasia splendens (1824, 'Analecta Entomologica,' Pl., fig. 3) was inaccurate. This figure was, moreover, corrected in a later work (1828, 'Aussereurop, Zweifl. Ins.,' I, Pl. IV, fig. 3d), where Wiedemann placed Lasia among his Bombylarii, a group corresponding fairly well to the present family Bombyliidæ, although it also contained some Nemestrinidæ. Two years later (1830), Wiedemann described two additional South American species of Lasia, but placed them in Panops Lamarck, among his Inflatæ, which group

corresponds to the present family Cyrtidæ. One of these supposed new species, *Panops flavitarsis*, appears to be identical with his earlier *Lasia splendens*. The figures which he now gave of the head, antennæ and wing of *P. flavitarsis* (Pl. IX, figs. 2a-c), seem to be correct in all essential points.

The unfortunate confusion between Lasia and Panops, inaugurated by Wiedemann himself, was perpetuated by later authors, notably by Kertész, who united the two genera in his 'Catalogue of the Diptera of Panops Lamarck (1804, Ann. Mus. Hist. Nat. the World' (1909). Paris, III, p. 263), however, is strictly Australian, and differs conspicuously from Lasia in the shape of the face, where the antennæ are placed close to the vertex, as well as in the eves being bare and touching each other below the antennæ only. Hardy (1922, Papers Proc. Roy. Soc. Tasmania for 1921, p. 79) recognizes only two species. Macquart (1838, 'Dipt. Exot.,' I, 2, p. 166; misspelled Mesophyza by Bigot, 1889, Ann. Soc. Ent. France, (6) IX, p. 315) is a synonym of Panops, as shown by Schiner (1868) and Hardy (1922). It was based upon two species: M. scapularis Macquart (apparently a synonym of Panops flavipes Latreille) and M. marginata Macquart (generally regarded as identical with Panops baudini Lamarck, the genotype of Panops). Brunetti (1926, Ann. Mag. Nat. Hist., (9) XVIII, p. 580) selected scapularis as the type of Mesophysa. His interpretation of Panops is, however, confusing, since he places baudini (the genotype of Panops) in Mesophysa, while he states that Kertész was in error in sinking Mesophysa under Panops. Brunetti must have been misled by Bigot's (1889) generic key of the Cyrtidæ.

That Panops and Lasia are generically distinct was first recognized by Schiner (1868, 'Novara Reise, Zool.,' II, Abt. 1, Vol. B, Dipt., pp. 141–142) and, it would appear, independently by Westwood (1876, Trans. Ent. Soc. London, p. 508). Lasia has been defined correctly and fully by Cole (1910). It is exclusively American and is recognized by the antennæ being placed at or below the middle of the head, far from the ocelli, and by the eyes being densely pilose and touching each other only above the antennæ. In all the species I have seen, the posterior ocelli are distinct; but the anterior ocellus is either very small and hidden within a slit-like depression of the vertex, or apparently lacking. Cole writes that the legs have "a tooth-like apical spur above and a sharp projection below." This statement, I surmise, refers to the tibiæ. I can find no trace of a true, articulated apical spur on the tibiæ of any of my specimens; but in some species the outer apex of the tibia is drawn out into a strong point,

while the inner apex is sharply angular. Cole adopts Verrall's (1909, 'British Flies,' V, p 450, fig. 259A) interpretation of the venation of Lasia and states that it is very close to that of the Nemestrinidæ. writes(1919, p. 8)that "in Hirmoneura the discal cell is absent, but otherwise the venation corresponds to Lasia." After examining the venation of many species of Nemestrinidæ, belonging to nearly all the known genera, I am unable to find any particular resemblance to Lasia. Nor do I see any reason why, in Hirmoneura, the large cell in the center of the wing, between the second basal cell and the first posterior cell and below the first basal cell, should not be regarded as the true discal cell, corresponding to the cell of that name in Cole's drawing of the wing of Lasia (1919, Pl. 1, fig. 1). Moreover, there is no trace of a diagonal vein in Lasia. while the division of the first basal cell, characteristic of Lasia, is not found in Hirmoneura, nor in any other nemestrinid. Turning to the characters of the head, thorax and abdomen, which in my opinion are much more important for tracing true relationships than details of the venation, I cannot see that the peculiarities of Lasia find their counterpart anywhere among the Nemestrinidæ.

For the purpose of this paper, I shall adopt Verrall's and Cole's interpretation of the venation of *Lasia*, as shown in Cole's Pl. 1, fig. 1 (1919). In a later paper (1919, Ent. News, XXX, Pl. x1, fig. 2), Cole has given an interpretation of the wing of *Lasia* in the terms of the Comstock-Needham system.

Lasioides Collado (1928, Eos, IV, 1, p. 57.—Monotypic for Lasioides peruanus Collado, loc. cit., p. 59, Fig. 1; Peru) is, as noted by the author, closely allied to Lasia, from which it differs only in the very long and wide, compressed and somewhat falcate third antennal segment, and in the very small head, not or hardly visible from above. Since the only known specimen of L. peruanus is a female, while most specimens of Lasia in collections are males, there is a possibility that these differences are sexual rather than generic. Collado calls attention to Philippi's description of the antenna of the Chilean Lasia rufovestita (Blanchard), which, if correct, would place that species also in Lasioides.

Brunetti (1920, 'Fauna Brit. India, Diptera Brachycera,' I, p. 164) described a *Lasia aurata* from India. But his accounts, both of the genus and the species, show conclusively that he misunderstood *Lasia*, even to the extent of placing it in the wrong subfamily. His Indian insect is certainly not congeneric with the American species of *Lasia*, although without a study of the specimen it is impossible to suggest where it belongs.

Disregarding L. rufovestita, which, as mentioned above, is probably a Lasioides, twenty species are at present recognized in the genus Lasia, two of them being described in this paper. There is, however, a possibility that some of the so-called species, listed as distinct in the catalogues, will prove to be synonyms, when they are critically compared. Chile appears to be the chief center of distribution, with eleven species, some of which are said to extend into Argentina and Brazil. Of the remaining nine species, three are found in Brazil, one in Ecuador, four in Central America, and one in the southwestern United States.

In my experience, the most reliable specific characters of Lasia are exhibited by the shape of the antennæ, the structure of the frontal or supra-antennal triangle (which corresponds to the "subcallus" of the Tabanidæ, called by Szilády the "antennal segment," a most unfortunate term), and the sculpture of the integument. Some peculiarities of the venation are also of value, but most of them are too variable to be trusted. The color of the integument, especially the different hues of bluish, green, violet, purple, or copper, as well as the presence or absence of metallic stripes on the thorax, appear to be rather unreliable, but the color of the tarsi seems to be of importance. Likewise the color of the pilosity cannot be depended upon to any great extent. Unfortunately, most published descriptions emphasize the color characters, thus often rendering positive identification mere guesswork.

In the following key of the five species known from north of Mexico, I have given prominence to the characters of structure.

3.—Integument coarsely sculptured; the individual punctures deep, large, close together; in the center of the first and second tergites they are crowded, so that the intervening spaces are narrower than the punctures. Anterior third of thoracic dorsum distinctly, though irregularly, striate on the sides. Third antennal segment elongate spindle-shaped, rather suddenly narrowed into the short, sharp apex. Length, 14.5 mm. (Yucatan).

L. yucatanensis, n. sp.

- - Upper half of frontal triangle saddle-shaped, with a deep, longitudinal depression separating two low tubercles. (Antenna unknown.) Abdomen more distinctly hairy; the pile short and black on first and second tergites, much longer and grayish yellow on the third. Pleura and humeri mostly with yellowish pile. Length, 17 to 18 mm. (Guatemala). L. scribæ Osten Sacken.

Lasia rostrata Aldrich

This species is known only from the holotype (0) and the supposed allotype (Q). Aldrich has expressed some doubts as to the conspecificity of the male with the specimen which he regards as the female, so that he did not venture to label the latter as the allotype. I believe, however. that these two insects certainly belong to one species, since they agree in all really important structural characters. I am not quite certain that they represent different sexes. The differences in color of integument and pilosity I regard as unimportant. As for the relative length of the proboscis, a careful study of a number of specimens of Lasia has convinced me that the individual insect is able to extend or contract this organ. The basal portion of the labium is built in a peculiar fashion, enabling a certain amount of contraction and extension of that part of the proboscis. The mandibles, on the other hand, are completely rigid, and it might be more correct to measure the proboscis along these organs, were it not that the tips of the mandibles are usually enclosed by the labium. Nevertheless, most specimens of Lasia show distinctly that the labella extend far beyond the tips of the mandibles.

In *L. rostrata*, the two posterior ocelli are present, though difficult to see; frontal triangle flat above, without hump or depression, strongly raised below, near the antennal sockets; antenna long and slender, the first segment completely free from the socket, a little over half the length of the second, the third nearly parallel-sided, about seven times the length of the second and of about the same width, broadly and bluntly rounded off at the apex. The species is related to *L. rufipes* Westwood, of Chile, which has the frontal triangle of the same shape, but has the third antennal segment much more pointed, while the legs are mostly or entirely yellowish.

Having seen no specimen which I can refer with certainty to L. splendens Wiedemann, I am unable to discuss the relations of L. rostrata to that species; but, if Wiedemann's figure of the antenna is to be trusted, the two species are certainly distinct. It should be noted, however, that Wiedemann's figure of the antenna of his L. flavitarsis (usually regarded as a synonym of L. spendens), is again very different.

Lasia colei Aldrich

Lasia colei Aldrich, 1927, Proc. U. S. Nat. Mus., LXXII, Art. 9, p. 1 (3; Higuito, San Mateo, Costa Rica).

This species also is known only from the holotype. The antennæ are more slender and much more pointed than those of L. yucatanensis, being more like those of L. klettii; the first segment is mostly hidden in the socket. Posterior ocelli quite distinct. Frontal triangle very slightly and evenly swollen throughout, without tubercle or depression in the upper part and not raised near the antennal sockets.

Lasia scribæ Osten Sacken

Lasia scribæ Osten Sacken, 1887, 'Biol. Centr.-Amer., Dipt.,' I, p. 166 (3'; Guatemala). Aldrich, 1905, 'Cat. North Amer. Dipt.,' p. 221. Cole, 1919, Trans. Amer. Ent. Soc., XLV, p. 30 (copy of description only).

Panops scribæ Kertész, 1909, 'Cat. Dipt.,' IV, p. 10.

Osten Sacken's description was based upon two specimens. The whereabouts of one of these cotypes is unknown to me; the other, now part of the collections of the Deutsches Entomologisches Museum, at Berlin-Dahlem, has been sent to me for study by Dr. W. Horn. It is the specimen mentioned by Osten Sacken as lacking the end of the abdomen and as having the violet reflections of the thorax in the shape of stripes.

This cotype resembles superficially the holotype of *L. klettii*. No great importance should perhaps be attached to the slight differences in the hue of the integument and in the color of the pile. I believe, how-

ever, that the peculiar shape of the frontal triangle is a specific character of value; perhaps also, the sculpture of the labrum. The antennæ, when they are known, may furnish additional differences.

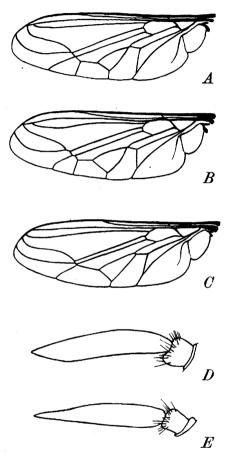


Fig. 1. A, left wing of Lasia scribæ Osten Sacken, cotype; B, left wing of Lasia yucatanensis, new species, holotype; C, left wing of Lasia ecuadorensis, new species, holotype; D, outer side-view of left antenna of L. yucatanensis; E, outer side-view of left antenna of Lasia klettii Osten Sacken, holotype.

The venation of the cotype seen is the same in both wings (Fig. 1A). It shows the following peculiarities, when compared with Cole's drawing of the wing of Lasia (1919, Pl. 1, fig. 1). The second vein ends in the first a considerable distance from the costa (more than twice as far as shown in Cole's figure). The upper branch of the third reaches the tip

of the second, just before the latter enters the costa. The two branches of the fork of the third are fused at the base, so that the second submarginal cell is shortly petiolate. The fourth vein forms one straight line with its upper branch, so that the second upper basal cell is closed by a simple cross-vein and not by three sections as in Cole's figure. The fourth posterior cell is shortly petiolate at the base. Although some of these peculiarities are not found in the type of *L. klettii*, I do not regard them as of specific value.

As the tip of the abdomen is lacking, the true length of this cotype cannot be determined; the proboscis likewise appears to be broken. but what is left of it extends slightly beyond the apex of the body. The wing is 16 mm. long.

The specimens from New Mexico and Mexico referred doubtfully by Cole to L. scribæ will be discussed under L. klettii.

Lasia klettii Osten Sacken

Lasia klettii Osten Sacken, 1875, in Wheeler's 'Rept. Expl. Surveys West of 100th Meridian,' V, Zool., p. 805, Figs. 1-3 (no sex given; Apache Camp, Arizona); 1877, Bull. U. S. Geol. Geogr. Survey, III, 2, p. 278; 1878, Smithson. Miscell. Coll., No. 270, p. 99. Aldrich, 1905, 'Cat. North Amer. Dipt.,' p. 221. Cole, 1919, Trans. Amer. Ent. Soc., XLV, p. 29.

Panops klettii Kertész, 1909, 'Cat. Dipt.,' IV, p. 9.

The holotype of *L. klettii* was collected by Francis Klett in September 1873, at Camp Apache (now called Fort Apache), in Apache County, not very far from the border of New Mexico. It appears to be a male. In general aspect it is so much like my very fresh specimen of *L. yucatanensis* that I believe only little of the original pubescence has been lost through preserving the insect in alcohol.

Osten Sacken's woodcut of the venation (Fig. 3) applies to the left wing only, although his Fig. 1 shows the venation alike in both wings. In the right wing the upper branch of the fourth vein is simple at the tip, not bifurcate as in the left wing; while the projecting stump on the upper branch of the fork of the third is barely indicated. These two peculiarities of the venation are therefore mere abnormalities. In Osten Sacken's Fig. 1, the dorsum of the thorax shows two incomplete stripes which are not mentioned in the description. On the specimen they are merely slightly depressed areas, rather difficult to see and not different in color from the remainder of the dorsum; most probably they are accidental and caused by the method used to preserve the insect.

Williston (1886, Trans. Amer. Ent. Soc., XIII, p. 294) referred to L. klettii (misspelled kletii) two specimens from New Mexico, and I am

inclined to regard his identification as correct. Cole has evidently seen the very same specimens, now at Kansas University, which obtained most of Williston's personal North American collection (except Syrphidæ and some duplicates). Disregarding color differences, which, as stated above, I do not regard as reliable, there is nothing in Cole's additional notes that might not be found in L. klettii. Unfortunately the antennæ are only incompletely described and the structure of the frontal triangle is unknown. It should be noted that the type locality of L. klettii, in Arizona, is close to the border of New Mexico.

Cole also referred doubtfully to *L. scribæ* a poorly preserved fly from the old C. V. Riley Collection, now at the U. S. National Museum. This specimen lacks the antennæ. The sculpture is like that of *klettii*, and the presence of long black pile on the pleura and humeri would also seem to indicate that species, and not *L. scribæ* as Cole suggested. The shape of the frontal triangle, with the raised tubercle, is like that of the type of *L. klettii*.

Lasia yucatanensis, new species

Large, metallic blue, moderately shiny, with slight purplish reflections, sparsely pilose. Puncturation coarse. Legs black. Third antennal segment gradually narrowed into the short, sharp apex.

MALE.—Head moderately large, hemispherical. Eyes densely covered with short, light yellow pile, contiguous over about the upper half of the head, between the small ocellar tubercle and the short frontal triangle. Ocellar tubercle low, broadly triangular, with the two posterior ocelli large and distinct, the anterior ocellus minute and hidden within a slit-like depression. Antennæ (Fig. 1D) narrow; first segment very short, mostly hidden within the antennal socket; second almost square in side view, with rounded upper and lower angles, about as broad as long; third about five times the length of the second, slightly flattened from the sides, in profile elongate spindle-shaped, with the lower margin straighter than the upper one, gradually narrowed toward the base and more suddenly toward the short and sharp apex. Proboscis very long and slender, longer than the body, the labium ending in two very long and narrow labella; labrum (covering the base of the proboscis in the deeply excavated face) smooth, without striation or visible punctures, with a superficial median groove. Frontal triangle very slightly raised in the middle above, without median depression. Thorax and abdomen broad and very convex, forming in profile an even curve dorsally and an almost straight line ventrally. Wing venation (Fig. 1B) essentially as in the allied species; curiously enough it duplicates almost exactly that of the cotype of L. scribæ which I have studied (Fig. 1A).

Integument densely covered with moderately coarse punctures (except on the head) which almost everywhere are larger than their smooth intervals; this is especially striking in the center of the first and second tergites. In addition to the punctures, the sides of the anterior third of the thoracic dorsum show a series of irregular wrinkles, which tend to radiate from the hind angles of the humeri. Pleura

coarsely, transversely striate. Fourth and fifth tergites and all the sternites with a fine, irregular, transverse striation.

Body very little hairy, almost bare dorsally, especially on the abdomen. Occiput with some short, grayish-yellow pile. Dorsum of thorax with scattered, short, yellowish hairs which are denser and longer on the anterior margin and on the humeri, and still more so on the pleura and sternum. Hairs of the abdominal tergites very short, pale yellowish, as sparse on the third tergite as elsewhere. Legs with short yellowish hairs, somewhat silvery on the outside of the tibiæ, mixed with blackish pile on the femora and with russet on the tarsi.

Body metallic blue, with slight greenish or purplish reflections, especially on the dorsum of the thorax; under side of the abdomen violet. Antennæ black, with the third segment narrowly yellow at the base. Proboscis black. Legs black; apices of the femora and under side of tarsi slightly brownish; claws black. Wings slightly and uniformly smoky; squamæ blackish; halteres black, with yellowish white stalk.

Length, 14.5 mm.; of wing, 13 mm.; of proboscis, 15 mm.

Yucatan.—Chankom, one male, holotype, June 20, 1929 (J. Bequaert collector; Mus. Comp. Zool.).

This striking insect was hovering near me as I was walking through a patch of low, scrubby forest, on a moderately sunny morning, after several days of rain. Its behavior was so much like that of the common green bee, *Euglossa cordata* (Linnæus), found in the same locality, that I was completely deceived by it, until the fly came to rest on a leaf. The resemblance between the two insects, though extraordinary in life, is by no means as striking when they are pinned side by side after death.

The coarser puncturation gives L. yucatanensis a much duller appearance than L. scribæ and L. klettii. These three species are closely allied and form in the genus Lasia a distinct group characterized by the very large size, the peculiar ending of the second and upper branch of third veins, and the sparse pilosity. L. colei, however, forms the transition between this group and the more usual type of Lasia, so that it does not seem worthwhile to separate the group into a distinct subgenus.

Lasia ecuadorensis, new species

Small, metallic green and very shiny, with dense and long pilosity. Puncturation extremely fine. Legs black. Second branch of fourth vein absent. (Antennæ unknown.)

Male.—Head rather small, hemispherical. Eyes densely covered with very long, pale yellow pile, contiguous over about the upper half of the head, between the very small occilar tubercle and the very short frontal triangle. Occilar tubercle very low, broadly triangular, with the two posterior occili small but distinct, the anterior occilius invisible. Antennæ: first segment small but free from the antennal socket, about as long as wide at apex; second only a little longer than the first, but more swollen; (third broken off). Proboscis much longer than the body, very slender, the labium ending in two very long and narrow labella; labrum entirely smooth.

Frontal triangle with a depression on each side of the middle, defining an anterior transverse swelling which continues behind into an upper, low tubercle. Thorax and abdomen broad, moderately convex dorsally, forming ventrally a straight line in profile. Wing venation (Fig. 1C) essentially as figured for the genotype, except that the second branch of the fourth*longitudinal vein is entirely lacking, so that the second and third posterior cells are fused; the first, second, and upper branch of the fork of the third, longitudinal veins end separately in the costa at a considerable distance from one another; the two branches of the fork of the third are widely separated at their base (on the second upper basal cell); the fourth vein forms one straight line with its upper branch; the fourth posterior cell is sessile at the base. Venation alike in both wings.

Integument with exceedingly fine and much scattered punctures, visible only under a high magnification; no striation, not even on the pleura.

Body very densely coverd with long hairs, which are grayish yellow, mixed with black on the thorax, mostly black and more uneven on the abdomen. Legs with long, yellowish pile, mixed with shorter, more russet hairs.

Entirely metallic green, even on the under side of the abdomen; appearing darker dorsally, on the abdomen, owing to the black pilosity. Legs black. Proboscis black. Wings subhyaline, hardly smoky.

Length, 9 mm.; of wing, 8.5 mm.; of proboscis, 14 mm.

Ecuador.—Ambato, 1° 10′ S., 78° 42′ W., one male, holotype (Amer. Mus. Nat. Hist.).

Although the type is incomplete, I venture to describe it because no species of *Lasia* has as yet been reported from Ecuador. Additional specimens will have to decide whether or not the absence of the second branch of the fourth vein is a reliable specific character.

